

Serial No. 10/766,035  
Docket No. F03-363-US  
Ref. No. FUJIT.064

## **REMARKS**

### **INTRODUCTION**

Claims 1 and 3-20 are pending in the application. Claim 2 has been canceled. Claims 1, 3, and 5 have been amended. Claims 6, 7, and 12-14 have been rewritten in independent form to capture subject matter indicated to be allowable. Claims 1 and 2-20 presently are pending.

It is noted that the claim amendments are made only to assure grammatical and idiomatic English and improved form under United States practice, and are not made to distinguish the invention over the prior art or narrow the claims or for any statutory requirements of patentability. Further, Applicant specifically states that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Claims 3 and 5 stand rejected under 35 U.S.C. § 112, second paragraph based on informalities. Claims 3 and 5 have been amended to address these concerns and are submitted as particularly pointing out and distinctly claiming the invention.

Claims 1-5, 8-11, and 15-18 stand rejected under 35 U.S.C. § 102 as being anticipated by U.S. Pat. No. 4,779,280 to Sermage et al. Claims 19 and 20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Sermage et al. in view of U.S. Pat. No. 6,282,345 to Schimpe. Applicants respectfully traverse these rejections.

### **THE CLAIMED INVENTION**

The claimed invention is directed to an edge-emitting type laser. A laser cavity is formed by depositing plural semiconductor layer on a crystal growth substrate. The laser cavity is formed such that the refractive index of a part right under the n-type contact layer

and right below the laser is smaller than that of the n-type contact layer, effectively containing the light on the laser side of the cavity.

In the present invention, after an n-type contact layer is formed with uniform thickness on a substrate, a thinner part of the n-type contact layer is formed right beneath a laser cavity and the rest remains thick.

Initially, forming a thick n-type contact layer on a substrate results in excellent crystallinity on the upper surface of the n-type contact layer. Consequently, the resulting crystallinity of the laser cavity also is excellent. If a uniformly-thin n-type contact layer initially is formed, the crystallinity of the of the n-type contact layer is not sufficient. Thus, crystallinity of the laser cavity in the n-type contact layer decreases, as does the oscillating efficiency of the laser.

## **THE REFERENCES**

### **The Sermage et al. Reference:**

Sermage et al. teaches a thin n-type contact layer 15 formed on a substrate. See FIG. 2. Sermage et al. does not disclose or suggest, however, the n-type contact layer having a thick portion. Since the n-type contact layer of Sermage et al. is thin, it is not thinned by etching from the back of the substrate. Therefore, crystallinity of n-type contact layers with thickness of 0.2 microns is unacceptably less than excellent, as well as that of active layer 15.

In the present invention, etching the thick n-type contact layer makes the part right beneath the laser cavity have a certain thickness. On the other hand, Sermage et al. discloses etching a buffer layer. The n-type contact layer disclosed by Sermage et al. is uniformly thin.

Sermage et al. does not teach improving the far field pattern (FFP) and consequently does not indicate any need or method for preventing FFP from rippling by making a thick n-

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type contact layer thin right beneath the laser cavity. Consequently, Sermage et al. does not teach or suggest formation of the thin area beneath the laser cavity so as to maintain its high crystallinity.

**The Schimpe Reference:**

Schimpe has been cited for the proposition that it would have been obvious to substitute a DFB structure in the laser disclosed by Sermage et al. to enable frequency selection. Schimpe does not remedy the deficiencies of Sermage et al.

Accordingly, Sermage et al. and Schimpe do not provide a proper basis for rejecting any of the claims pending in the application.

**CONCLUSION**

In view of the foregoing, Applicant submits that claims 1 and 3-20, all the claims presently pending in the application, are patentably distinct over the prior art of record and are allowable, and that the application is in condition for allowance. Such action would be appreciated. Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned attorney at the local telephone number listed below to discuss any other changes deemed necessary for allowance in a telephonic or personal interview.

To the extent necessary, Applicant petitions for an extension of time under 37 CFR §1.136. The Commissioner is authorized to charge any deficiency in fees, including

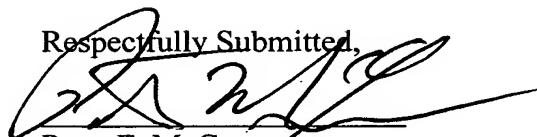
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extension of time fees, or to credit any overpayment in fees to Attorney's Deposit Account

No. 50-0481.

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Respectfully Submitted,



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